

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. APPLICATION NO. 09/813,992
ATTORNEY DOCKET NO. Q63598

REMARKS

To summarize, claims 5, 7, and 11-14 are under consideration in the present application (claims 1-4 and 8-10 having been withdrawn from consideration in the present application, and claim 6 having been canceled in a previous response). Claims 5, 7, and 11 are cancelled without prejudice or disclaimer by this Amendment.

In the present Office Action, the examiner maintains the previous rejection of claim 5, and additionally rejects claims 12-14, under 35 U.S.C. § 112, first paragraph. Additionally, the Examiner now rejects claims 5 and 11 under 35 U.S.C. § 102(e) as being anticipated by Korean Unexamined Patent Application, Publication No. 1999-0085774. Furthermore, the Examiner rejects claims 5 and 11 under 35 U.S.C. § 103(a) as being obvious over Lee et al. (U.S. Patent No. 5,872,390) in view of Abe (JP-07-273200 A). The Examiner also rejects claim 7 under 35 U.S.C. § 103(a) as being obvious over Lee in view of Carson et al. (U.S. Patent No. 6,172,929), and claim 12 under 35 U.S.C. § 103(a) as being obvious over Lee in view of Abe, and further in view of Carson.

Applicant's remarks on the individual claim rejections are as follows.

I. Claim Rejections under 35 U.S.C. § 112, first paragraph

The Examiner maintains the rejection of claim 5 and rejects newly added claims 12-14 under 35 U.S.C. § 112, first paragraph.

Claim 5 is cancelled, and therefore, the rejection of claim 5 is moot.

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With respect to claim 12, the Examiner asserts that the claim language "a pitch substantially equal to a spot diameter of a laser beam to be used for cutting" is not supported by the specification. One of the aspects of the present invention is to provide an integrated circuit device that prevents the adjacent fuse electrodes from being short-circuited by fragments of components of a cut off fuse when the fuse electrodes are arrayed at a high density that corresponds to spaced intervals smaller than the spot diameter of the laser beam used to cut off the fuse. That is, Applicant discloses that it is advantageous to provide the fuse electrodes with a higher density (i.e., a smaller pitch). The specification clearly supports "a pitch less than a spot diameter of a laser beam to be used for cutting said fuse electrodes", and additionally, the higher density is disclosed as being advantageous. Thus, Applicant amends claim 12 to recite "a pitch less than a spot diameter of a laser beam to be used for cutting said fuse electrodes". This amendment should overcome the rejection of claims 12-14 under 35 U.S.C. § 112, first paragraph, and therefore, withdrawal of this rejection is respectfully requested.

As for the language of claim 14, which recites:

wherein at least one successive fuse electrode of said plurality of fuse electrodes is disposed in a position in said insulating film that is the same as a position of a preceding fuse electrode of said plurality of fuse electrodes, in a direction of a thickness of said insulating film,

the Examiner alleges that this language means that a second fuse is formed above and aligned with a lower first fuse in the insulating layer. Applicant respectfully disagrees.

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In the illustrative, non-limiting embodiment of claim 14 (which is described at page 32, lines 6-10, of the specification), the fuse electrodes are displaced into successive positions in the upper or lower layer. As an alternative example, a certain number of fuse electrodes may be displaced together in the upper layer, followed by a number of fuse electrodes displaced in the lower layer. Thus, the Examiner's characterization of the language of claim 14 is inaccurate. However, claim 14 is amended herewith in order to clarify this feature further.

II. Claim Rejections under 35 U.S.C. § 102

In the present Office Action, the Examiner rejects claims 5 and 11 under 35 U.S.C. § 102(e) as being anticipated by Korean Unexamined Patent Application Publication No. 1999-0085774.

Claims 5 and 11 are cancelled, and therefore, this rejection is moot.

III. Claim Rejections under 35 U.S.C. § 103

A. Claims 5, 7, and 11:

Claims 5 and 11 are rejected under 35 U.S.C. § 103(a) as being obvious over Lee in view of Abe. Claim 7 is rejected under 35 U.S.C. § 103(a) as being obvious over Lee and Carson. As set forth above, claims 5, 7, and 11 are cancelled, and therefore, these rejections are moot.

B. Claim 12:

Claim 12 is rejected under 35 U.S.C. § 103(a) as being obvious over Lee in view of Abe, and further in view of Carson. Applicant traverses this rejection for several reasons.

The Examiner acknowledges that Lee does not disclose a plurality of cutting positions disposed in respective positions, which are different from each other in a direction in which the

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fuse electrodes extend. However, the Examiner looks to the newly cited reference Carson for this feature. In particular, the Examiner alleges that Carson discloses a plurality of fuse electrodes 68o-68y or 64o-64y) extending parallel to each other and including adjacent fuse electrodes disposed in respective layers (see 68o and 64o in Fig. 4B) which are different from each other. With this configuration, the Examiner takes the position that the fuse portion of the device will occupy a smaller area, thus reducing the size of the devices (see col. 3, lines 46-54). Therefore, the Examiner alleges that it would have been obvious to modify the plurality of fuses of Lee by stacking adjacent fuses in a different layer as taught by Carson to form more fuses while reducing the size of the fuse area. For at least the following reasons, Applicant respectfully disagrees with the Examiner's position.

The Examiner merely cannot pick and choose elements from the cited references without considering the references as a whole for what these references teach or suggest to a person of skill in the art. Instead, the Examiner must consider the references as a whole and establish some motivation or suggestion, either in the references themselves or in the art in general, for combining the references in manner recited in the claims.

Carson discloses fuses 64 and 68 disposed in different layers and *vertically aligned with each other* (see col. 3, lines 46-51). Additionally, the fuses 64 in the upper sub-bank are designed to open if exposed to a laser beam that is tuned to a first frequency, while the fuses 68 in the lower sub-bank are designed to open if exposed to a laser beam that is tuned to a second frequency (see col. 4, lines 15-24). Specifically, Carson discloses three possible fuse states: (1) both open, (2) both closed, and (3) fuse 64 open and fuse 68 closed (see col. 4, lines 24-28).

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Thus, when considered as a whole, Carson clearly discloses a device in which the fuses are vertically aligned with each other.

Therefore, any combination of Lee and Carson would not result in the claimed invention. That is, assuming *arguendo* that a motivation exists to combine Lee and Carson, the resulting combination would not result in the claimed combination. Instead, the resulting combination would result in (at best) a fuse window with controlled oxide thickness (as disclosed in Lee) in which two electrodes are “stacked” in a vertical direction (as disclosed by Carson). Thus, any combination of Lee and Carson would not result in the claimed combination, particularly, with at least one fuse electrode “disposed in a position in said insulating film that is different from a position of at least one other of said plurality of fuse electrodes, in a direction of thickness of said insulating film”, as recited in claim 12. Instead, the adjacent fuse electrodes would be disposed in the same layers (i.e., fuses 64o-64y in the upper layer and fuses 68o-68y in the lower layer).

Moreover, since the upper fuse 64 of Carson must be opened prior to opening the lower fuse 68, it is not possible to achieve a state in which fuse 64 is closed and fuse 68 is open. On the other hand, in Applicant’s claimed device, each fuse can be independently opened irrespective of the state of any other fuse.

Further, the Carson device does not mention the problem of short-circuiting caused by scattered fragments of the components of the fuse electrodes that are cut off. That is, since the fuses 64 and 68 are vertically aligned in different layers, cutting fuse 64 with the first laser may cause short-circuiting of the fuse 68 due to scattered fragments of the fuse 64 (for example, in a

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state in which fuse 64 is open and fuse 68 is closed). On the other hand, Applicant solves this problem. In other words, the fuse electrodes of claim 12 are not vertically aligned, as disclosed by Carson. As such, Applicant's invention provides a high density of fuse electrodes while eliminating the problem of short-circuiting caused by scattered fragments of the components of the fuse electrodes that are cut off.

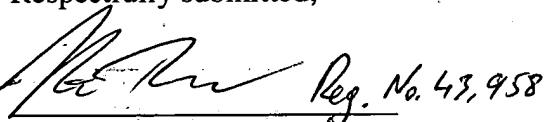
For at least the foregoing reasons, claim 12 would not have been obvious over Lee in view of Abe, and further in view of Carson.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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